CV - Eva Pokojska

1. Motivation

Can we understand holographic information 'formed' in heterogeneous, multiscale elm/vibr scattering environment (atmosphere+, water/ocean, snow-ice)? How such information is propagated, distributed, ?stored, and made accessible in growth/decay-structured systems? How to balance availability and efficiency when managing heterogeneous information/energy sources? What global advantages brings anticipative vs. adaptive harvesting of elm/vibr-spectrum (bio, econ)? In multicellular systems, how intracellular clocks are used, and kept synchronized (& what's the environmental drive)? Can we design adaptive materials based on theoretical knowledge on systems, matter, and information processing? What is the interplay of cooperativity, transport delay, and 3d-diffusion in systems of coupled oscillators? Where can we use our knowledge and understanding to optimize human/societal interaction with ecosystems, environment, and celestial-driven climate? How to achieve more heterogenous distribution of societies, tech-tools, and their (autonomous) energy harvest?

1.1 Keywords

[i] <u>Dynamical systems</u>, dissipative/ergodic systems, <u>delays</u>, spacetime-scales.
<u>Topology</u> of manifolds, semilocal & global attractors, transient behavior, 3d-flow
<u>image reconstruction</u>.

[iii] <u>Graphs</u>, adaptive connectivity, information & game theory, N-body pb.
<u>Regulatory networks</u> (modeling & analysis), complex input–response,
competitive processes & thinking, dynamic context.

[iv] <u>Embryogenesis</u>, differentiation clock, <u>circadian/seasonal</u>/societal dynamics,
adaptation/anticipation, differentiation/regeneration, epigenetics.

[v] <u>Environmental physiology</u>: cosmic rays, (space) weather, climate, atmospheric chemistry
(photo/redox, air-water-ice/soil, biogeochem), phenology. <u>Remote sensing</u>.

[vi] <u>(Photo)bioenergetics</u>, (mitochondrial) respiration, <u>respiratory adaptation</u>
(cyanobact/algae » humans). <u>Air-quality</u>, landscapes & constructions
(polar/mountain/desert/urban).

[vii] Elm spectra/polarity dynamics, <u>light-matter interaction</u>, relativity, metamaterials.
<u>(Bio)photonic structures</u>, molecular antenna, functional materials. Complex/<u>feedback imaging</u>.

[vii] (Bio)inorganic catalysis, <u>chiral chromophores</u>. Molecular signaling, structural chemistry–bioinformatics.

2. Education

2007/11 - 2001 Postgradual studies
Masaryk University, Faculty of Medicine, Dept of Pathophysiology,

Kamenice 5-A18, CZ-62500 Brno, Czech Republic.
Field: Normal and Pathological Physiology.
PhD thesis: <u>Geometry, Dynamics, and Regulation in Biological Questions</u>.
Brno 2007 (not defended @2011)

2001 - 1995 Pregradual studies
Masaryk University, Faculty of Medicine, Brno, Czech Republic
Field: General Medicine (+ immunology research project)
Degree: Doctor of General Medicine, MUDr. (equivalent to MD)
Thesis (research report): <u>Mononuclear cells proliferation dependent on stimulation by food antigens: Human colostra and cord blood immunological factors</u>. Brno 2001.

3. Research Experience
3.1 Scientific Visits and Permanent Positions

2012 - 2009
Inst. Atmospheric Physics, ASCR (project prep., collab. Biol Brno/Trebon/CesBud), CZ.
UJF Grenoble / CNRS / PolyX (EDF+meteoFR, extremePhysiol@Ecrins, LGIT/LGGE/ERCA), F.
Karlsruhe Inst of Technology (School PhotOpti; Inst MeteoKlim Redmann, Moehler), D.
Lab Matiere et Syst Complexes, Uni Paris 7, F (Y.Couder ENS, V. Fleury).
Ecole Sup Phys Chem, ESPCI Paris (E.Fort, A.Dijksman, A.Mayer)
Inst des Math de Jussieu & IHP, Uni Paris 6/7, F.
Dept di Matematica i Applic, Uni Milano Biccoca, I (group L.DeMichele).
Max Planck Inst Physics of Complex Systems, Dresden, D.
Frauenhofer Inst for Physical Measures, Freiburg, D (P.Fischer, Rowl Harvard).
   Study & research visits.

2008 – 2007
Max Planck Institute Mathematics in the Sciences, Leipzig, Germany.
Group Complex Structures in Biology and Cognition – Dynamic Networks
(F.Atay, group J.Jost), MPG postdoc fellowship.

2009-2005 (5x3 months)
Inst. des Mathematiques de Jussieu, Universite Paris 6/7, F. Study & research visits.

2007 - 2005
Institute of Systems Biology and Ecology, Czech Academy of Sciences, Nove Hrady,
Czech Republic. Mathematical Biology Group (L. Nedbal), research position.

2006 - 2005
Institute of Physical Biology, Academic & S. Bohemia University Center, Nove
Hrady, Czech Republic. Laboratory of Applied Photobiology and Bio-Imaging
(L. Nedbal), research & teaching position.

2005 (2x3 months)
Inst. Henri Poincare, Paris, F. Trimester 'Time at Work'.
Inst. Pasteur, Paris, F. Biological Software & Databases Group.

2005 - 2003
Institut Jacques Monod, CNRS/Universite Paris 6 et 7, F. Modeling in
Integrative Biology (group K. Pakdaman, R. Ouifki): Mathematical modeling
of elementary gene regulatory network with delay (autoregulation of a
transcriptional repressor), 'hierarchical' model of neuroendocrine-immune
system. Dynamic behavior of the model is studied using/programing tools for
mathematical/ numerical analysis and simulations. Piece-wise constant model,

discrete-time system, ordinary and delay differential system; stochastic and agent-based models. Suggesting experiments to prove model predictions.

2003, May - Jan
Inserm U444/707, Epidemiologie et Science de l'Information, Faculte de Medecine St. Antoine, Universite Paris 6, F. Modeling group (group K. Pakdaman, D. Mestivier): Building a phylogeny-motivated model of the neuroendocrine-immune regulatory network (rule-based formalisms, logical model of regulatory networks, C programming).

2003, 2002 (1.5 months)
Center for Molecular & Biomolecular Informatics, Radboud Uni, Nijmegen, NL (group G. Vriend).

2004 - 2001
Dept. of Pathophysiology, Faculty of Medicine, Masaryk University (V. Znojil, group J. Vacha): PhD thesis: Geometry, Dynamics, and Regulation in Biological Questions. Using bioinformatic methods for sequence/structural alignments, functional 'alignments', phylogenetic studies. Multiparameter classification of mediators. Research&teaching position - Pathol Physiology.

2001 - 1998
Dept. of Clinical Immunology and Allergology, Faculty of Medicine, Masaryk University (I. Nentwich, group J.Lokaj): Research in the field of atopic diseases (Mononuclear cells proliferation dependent on stimulation by food antigens: Human colostra and cord blood immunological factors. Statistical analyses - Statistica 5.5, RIA, ELISA, flow cytometry).

1997 - 1996
Dept of Biology, Faculty of Medicine, Masaryk University (group O. Necas): Co-work on topic 'UV irradiation effects on cytoskeleton of the yeast Saccharomyces cerevisiae' (fluorescence microscopy).

4. <u>Publications</u>, Posters, Talks

4.29
Pokojska Eva *et al*. <u>Space weather, atmospheric dynamics, and cellular respiration</u>. In preparation 2012.
4.28
Pokojska Eva. (Cellular) respiration as an adaptation to climate, environment, and ecosystem dynamics. ISSAOS school, LNGS Assergi 2011. Talk.
4.27
Pokojska Eva. Spacetime memory, induced regularization, and molecular antenna. ISI-CSAS Brno 2011. Talk (planned).
4.26
Pokojska Eva. Evolutionary time: Topology and dynamics of turbulence. Fundamental-Physics Meeting, Paris-Dourdan 2010. Talk.
4.25
Pokojska Eva. Physiological illumination: concepts, sources, strategies. Brno Apr2010+. Tech report.
4.24
Pokojska Eva. Beyond smartly adaptive intracellular memory device: Optimizing energy management from heterogeneous sources. Clocks, Switches, Signals & C'nano IdF school. WMI Warwick & Paris/Tremblay 2010. Talk & Poster-discus.
4.23
Pokojska Eva. <u>Beyond smartly adaptive intracellular memory device. (State-dependent delay controls regularity of a memory device)</u>. Invited for *Proceeding of AIMS* (*DCDS-A*) *suppl* 2011 (based on talk @8th AIMS IntConf DynSyst, Dresden 2010).
4.22
Pokojska Eva. Beyond smartly adaptive intracellular memory device.
In NET2009 (Networks: Dynamics and Flows). WMI Warwick 2009. Discussion.
In SDDE'09 (State-Dependent Dynamical Systems). MPI-PKS Dresden 2009. Poster-discus.
4.21
Pokojska Eva. Intracellular clocks, information accessibility, and structuring population. In MatApp Uni Milano-Bicocca. Milano 2009. Talk.
4.20
Pokojska Eva. <u>Soft functional materials in graph abstraction</u>. Leipzig 2008. *MPI MiS report* (see Thesis-Supplement).
4.19
Pokojska Eva. <u>Evolution of information accessibility</u>. Leipzig 2008. *MPI MiS report* (see Thesis-

Supplement).
4.18
Pokojska Eva. Intracellular clock, information accessibility, and structuring population. In Random Dynamical Systems Workshop. Bielefeld 2008. Talk - cancelled.
4.17
Pokojska Eva. Adaptive photo-thermal adaptation controls boundaries inside structuring population, working paper of 2008, in preparation.
4.16
Pokojska Eva, Ouifki Rachid. Intracellular clocks, information accessibility, and structuring population. Intended as invited chapter for Atay 2010, finally to appear as a joint-paper in 2012 (see Thesis-Supplement).
4.15
Pokojska Eva. Geometry, Dynamics, and Regulation in Biological Questions. (*PhD thesis*). *Masaryk University*, Brno, version vOct2008 (~vNov2007). Summary vFeb2011.
4.14
Pokojska Eva, Ouifki Rachid. Intracellular clocks and delay-dependent structure of periodic solutions. In Max Planck Inst Math in Sciences, Leipzig 2008. Talk.
4.13
Pokojska Eva, Ouifki Rachid. Delay dynamics of nuclear transcription (auto)regulation. In 27th Dynamics Days Europe, Loughborough 2007. Talk.
4.12
Ouifki R, Pokojska E, Pakdaman K. Local and global stability analysis and bifurcation in a model of delayed transcription autoregulation. Working paper 2006-8, in preparation(?)
4.11
Pokojska E, Ouifki R. Delay dynamics of nuclear transcription autoregulation. Workshop on Dynamical Systems, MSRI Berkeley 2007. Poster.
4.10
Pokojska Eva. Diurnal rhythms in bacteria, higher plants, insects, and mammals.
Nove Hrady 2006. *ISBE ASCR review-report*.
4.9
Pokojska E, Ouifki R. Dynamics of nuclear transcription autoregulation: Bifurcation and periodic solutions in a negative feedback loop with delay.
Physica D – Nonlinear Phenomena, submitted 2006, revised 2008 for a joint-publication (delayed-publication).
4.8
Pokojska E. Dynamics of nuclear transcription autoregulation: Bifurcation and periodic solutions in a negative feedback loop with delay. RWTH Aachen 2006. Talk.
4.7
Pokojska E, Ouifki R, Pakdaman K. Transcription repressor autoregulation: Bifurcation and periodic solutions in a regulatory loop with delay. ECMTB2005, 6th European Conference on Mathematical and Theoretical Biology, Dresden 2005. Poster.
4.6
Pokojska E, Ouifki R, Pakdaman K. Transcription repressor autoregulation: Mathematical/ numerical analysis. ICSB2004, 5th Internat Conf on Systems Biology, Heidelberg 2004. Poster.
4.5
Nentwich I, Pazdirkova A, Koberska I, Pokojska E, Szepfalusi Z, Lokaj J. Cow milk-specific humoral and cellular immune response in infants with high risk of atopy under feeding a whey hydrolysate infant formula. *Klin Padiatr*. 2003, 215(5):275-9. In German.
4.4
Pokojska E. Exploring dynamics within the neuroendocrine-immune system.
IBRO 2003, 6th World Congress of Neuroscience, Praha 2003. Poster.
4.3
Pokojska E. Hormonal network modeling. ECMTB2002, 5th European Conference Mathematical Modeling and Computing in Biology and Medicine, Milano 2002. Poster.
4.2
Nentwich I, Pokojska E, Borek I et al. Selective priming of cord blood mononuclear cells with food allergens. EAACI 2001, *Proceedings of Annual Congress EAACI*, Berlin 2001.
4.1
E. Pokojska. Mononuclear cells proliferation dependent on stimulation by food antigens: Human colostra and cord blood immunological factors. Dept. of Clinical Immunology and Allergology, *Masaryk University* Brno 2001. Report in Czech (~MSc thesis).

5. Conferences/ Workshops, Courses/ Schools/ Lectures
5.1 Conferences / Workshops

2012
Metamaterials (Metamph conf+school), St.Petersburg, RU 2012 (Shalaev, Capasso, Hrabar, Engheta)

Atmospheric Electricity, Voeikov Geophys Observ, St.Petersburg, RU 2012 (Mareev, Kostinsky, Fr-Kamen)
Astrometrics, Pulkovo Observ, St.Petersburg, RU 2012 (Sidorenkov)
EGU General Assembly, solar-terrestrial & biogeochemistry, Vienna, AT 2012
Atmospheric Sciences Course (LectureNotes), Grenoble, F 2012

2011
Ocean Deoxygenation: Biogeochem+Ecol, EUR-OCEANS conf, Toulouse, F 2011 (V.Garcon),
Metamaterials (Metamph conf+school), Barcelona, SP 2011 (Tretyakov, Schuchinski)
Atmospheric Chemistry and Dynamics, FZ Juelich IEK-7/8, D 2011 (Wahner, Elbern)
Retinoids, EMBO workshop, Strasbourg IGBMC, F 2011 (org. C. Rochette-Egly)
Physics of the Ocean, DPG school, Bad Honnef, D 2011 (org. M.Visbeck, W.Roether)
Terrestrial Atmosphere & Cosmic Rays, ISSAOS School, LNGS Assergi-L'Aquila, I 2011 - talk
Arctic Climate, Bert Bolin Centre School, Abisko, SE 2011 (P.Krusic, B.Gunnarsson) - discuss
ICTPPO, Tetrapyrrole Receptors of Photosynthetic Organs, Berlin-Dahlem, D 2011 (Gartner)
Current Challenges in Climate Modeling, Centre4 IntMath, Uppsala, SE 2011 (Thies, Larsson)
Spin Chemistry meeting, Noordwijk/Leiden, NL 2011 (org. P.Hore, S.Basu, J.Matysik)
Coherent Structures in Dynamical Systems, Lorentz center, Leiden, NL 2011 (H. deBroer+)
FET'11, Eur Future Technologies conf, Budapest, HU 2011
Epigenetics, Brain and Behavior, Fondation IPSEN meeting, Paris, F 2011 (P.Sassone-Corsi)

2010
Neurogeometry of Brain (L.Tauc conf), Paris-Gif, F 2010 (org. Y.Fregnac, J.Petitot)
Cycles Circadiens, Paris 5 Descartes, F 2010 (org. Behar-Cohen)
L'illumination Physiologique en Art du Quotidien (workgrp), Paris+Brno - talk
Phys-chem Properties of Water & Balance Acidobasique (workgrp), Paris-d'Italie, F 2010
Spacetime Geometry & Quantized Projections, Paris-Dourdan, F 2010
  (Mayer, Dijksman, EP) - *talk*
Time (Poincare Seminar), Paris IHP, F 2010 (T.Damour, C.Villani, C.Solomon)
Molecular Spintronics, Paris-Abbaye Cernay, F 2010 (org. CNRS/Thales)
TaCoNa'10 (Theor&Comput Nano-Photonics), Bad Honnef, D 2010
  (D.Chigrin, U.Leonhardt, V.Veselago)
Eur Optical Soc Meeting, Paris, F 2010 (org. Lanzani,Lidzey,Herzig; Bradley,Leo,Zyss)
Eur Microwave Week (EuMC,EuWiT,EuRAD,EuMIC), Paris, F 2010
Photonic&Elm CrystalStructures PECSweb, Granada, E 2010 (C.Lopez;Pendry,Yablonovitch,Zhang)
Metamaterials School, KIT Karlsruhe, D 2010 (Stockman,McCall,Noginov,Soukoulis)
Metamaterials, Karlsruhe D2010
  (M.Wegener;Veselago,Solymar,Boardman,Shalaev,Ziolkowski)
Emerging FunctionalMaterials & Polymers, UPMC Paris, F 2010 (AJ.Attias,Eunkyo Kim)
Advanced Nanophotonics School, Ettore Majorana Center Erice, I 2010 (Martellucci,Sibilia)
Lightwaves and Microwaves School, Supelec Metz, F 2010 (org. J.Jacquet)
C'nano IdF Nanosci School, Paris/Tremblay, F 2010 (B.Placais;Coey,French,Novotny) - *poster*
Clocks, Switches, Signals, WMI Warwick, UK 2010 (org. D.Rand, A.Millar, M.White) - *talk*
Clay-IHP Millenium Prize (G.Perelman), Poincare/Thurston Conjectures (org.
  C.Villani, J.Carlson; E.Ghys-M.Atiyah-J.Morgan-C.McMullen-W.Thurston-
  S.Smale-S.Donaldso-D.Gabai-M.Gromov-B.Kleiner-G.Besson-GangTian)
Morphogenesis, Paris UP5, F 2010 (org. N.Peyrieras, P.Bourgine; Y.Couder, O.Pourqie)
7th AIMS Conference on Mathematical Sciences, Dresden, D 2010 (org.
  S.Siegmund, J.Voigt) – *talk*
Seminars: Networks @Supelec/LIP6 (M.Debbah, S.Fdida, A.Chaintreau)
Seminars: Photonics/Mag/QM @LPA/LKB-ENS (B.Placais, S.Haroche-CdF)
SemParis: INSP/CEA/Orsay, ISCpif, Courses @College-dFran (Phys,Math,Chem,Immu/Neuro)
Network Dynamics & Synchr, Cicada-CoSyDy Manchester, UK 2010 (Glendinning,Broomhead)
SPIE Photonics Europe, Brussels, B 2010 (Berghmans,Burgess,Hartmann,Popp,Thienpont)
Mixed States of Light & Matter, Bad Honnef, D 2010 (WEH Stiftung,org M.Weitz)

2009
KDOP'09 (KIT Days of Optics & Photonics), Karlsruhe, D 2009 (Wiersma, Orrit, Waessle)
TaCoNa'09 (Theor&Comput Nano-Photonics), Bad Honnef, D 2009
  (D.Chigrin, M.Stockman, V.Shalaev)
State-Dependent Delay Equations, MPI-PKS Dresden, D 2009 (J.Mallet-Paret, AR.Humphries)
Delayed Complex Systems, MPI-PKS Dresden, D 2009 (org. W.Just, E.Scholl)
NET2009 Networks: Dynamics and Flows, WMI Warwick, UK 2009 (I. Stewart, M.Kirkilionis)
Systems Biology & ECCS'09 EuroConf Complex Systems, Warwick, UK 2009 (Springer-cancel.
Atomes, Cavities et Photons, College dFrance Paris, F 2009 (S. Haroche, J-M. Raimond,
  C. Cohen-Tannoudji, T.Hantsch, RJ.Glauber, D.Kleppner, D.Meschede, A.Zeilinger,
  P.Zoller, L.Davido)
Diamond2009 (Diamond-like Materials,Carbon Nanotubes,Nitrides), Athens, GR 2009 (Elsevier)
Bio-inspired Photonic Structures, DIPC SanSebastian, E 2009
  (J-P. Vigneron, P. Berthier, J. Livage, E. Yablonovitch, C.Lopez, J.Zi, R.Prum, A.Parker)

Foundations of Modern Physics, Vienna 2009 (org. A. Zeilinger, IQOQI)
Dynamical Syst&Randomness, IHPoincare Paris, F 2009 (J-P. Thouvenot,A.Katok,R.Krikorian)
Seminar-series: Appl Math, UniMilano-Bicocca, It 2009 (org. S.Terracini, L.DeMichele) – *talk*
Magnétisme aujourd'hui : du pigeon voyageur a spintronique, UTLS Paris, F 2009 (M.Verdaguer)

2008
Spintronics, retrospectives and perspectives, CNRS/Thales Paris, F 2008 (A.Fert, P.Grunberg)
Interacting Particle Syst, Statistical Mechanics, Probability, Inst HPoincare Paris, F 2008 -
  partly (advis. G.Giacomin, J.Lebowitz, M.Mezard, S.Shlosman, A.Sinclair, W.Werner)
Fr Complex Systems School, ISCpif Paris, F 2008 (org. P.Bourgine, R.Doursat) – *project adviser*
Workshop on Random Dynamical Systems, Uni Bielefeld, D 2008 (org. B.Gentz)
Cmplx Dynam in Large Coupled Syst, FU Berlin, D 2008 (B.Fiedler,Wolfrum,Maistrenko,Yanchuk)
Dynamics Days Berlin-Brandenburg, Uni Potsdam, D 2008 (A.Pikovsky, M.Abel, U.Schwarz)
ECCS08 EuroConf Complex Systems, Jerusalem, IL 2008 (org. S.Solomon, S.Kirkpatrick)
GRC Magnetic Nanostructures, Aussois, F 2008 (org. S.Majetich, S.Bluegel; A.Fert)
Dynamics Days Europe (declined), TU Delft, NL 2008 (org. D. Lenstra) - cancelled
Amorphous Computing, ISCpif Paris, F 2008 (org. J-M. Giavitto, O. Michel, R. Doursat)
Algebraic Topology satellite (Paris) of 5ECM EuroCongress Mathatics (Amsterdam) 2008
SMBC08, Systems Biol of Mammal Cell, Dresden, D 2008 (M.Zerial,A.Deutsch,U.Klingmuller)
Bibif08, Bifurcations in Dynamical Systems, Bielefeld, D 2008 (org. W-J. Beyn, Th. Hulls)
DeGennes Days, College dFrance Paris, F 2008 (org. C.Cohen-Tannoudji,E.Guyon,J-F.Joanny++)
Rencontre du Nonlineaire, Inst HPoincare Paris, F 2008 (M.Lefranc,C.Letellier,L.Pastur)
School Math des Syst Cmplx, ISCpif Paris, F 2008 (K.Pakdaman; J.Spencer,M.Viana,H.Matano)
ReaDiLab, Reaction-diffusion and pattern formation in biology, Paris-Orsay, F 2008, 2007
  (org. D.Hilhorst, M.Mimura, H.Matano)
Tensor Decompos, MPI MiS Leipzig, D 2008 (W.Hackbusch;DeLathauwer,Kolda,Dahmen,Lubich)
Seminar-series: Dynam on Cmplx Networks, MPI MiS Leipzig, D 2008 (Jost,Atay,Olbrich)- *talk*

2007
Microscopic Origins of Dissipative Noise, MPI MiS Leipzig, D 2007 (org. N.Dirr,S.Luckhaus;
  R.MacKay, L.Bunimovich, C.Liverani, S.Olla, A.Mielke)
Mathematical Aspects of Celestial Mechanics, Inst HPoincare Paris, F 2007
  (org. J. Fejoz, J-P.Marco; lect. A.Neishtadt et al.)
Modeles Dispersifs et Dynamique des Fluides (honneur J-C. Saut), Paris-Orsay, F 2007
Statistical Physics OutOfEquilirium, Inst HPoincare Paris, F 2007 (cours D. Ruelle)
Complex Systems Summer School, ISCpif Paris, F 2007 (M.Rosenblum,B.Gentz,D.Feldman)
Dynamics Days Europe, Loughborough, UK 2007 (A.Champneys,B.Sanstede,E.Scholl)- *talk*
Nonuniformly Hyperbolic Dynamics and Smooth Ergodic Theory, Lisbon, PT 2007
  (honour of Ya.Pesin, org. A.Katok, L.Barreira)
Dynamical Systems (Emphasis on Extended Systems), MSRI Berkeley, US(CA) 2007- poster
  (2 workshops - org. incl. C. Jones, L-S. Young, E. Knobloch, N. Kopell; D. Lewis)
  http://www.msri.org/calendar/workshops/WorkshopInfo/385/show_workshop

2006
Ultradian Rhythm in Cyanobact, Nove Hrady, CZ 2006 (workshop - org. L.Nedbal,H.Pakrasi)
Intergators for Differential and Delay Eqns, Innsbruck, AT 2006 (workshop - A.Bellen,A.Iserles)
  http://techmath.uibk.ac.at/numbau/alex/events/conference2006.html
6th AIMS Dynamical Systems, Differential Equations, and Applications, Poitiers, F 2006
DyToComp Dynamics, Topology, and Computation, Bedlewo, PL 2006
  (workshop - org. M. Mrozek, K. Mischaikow), http://www.ii.uj.edu.pl/DyToComp2006/

2005
1st ECCS European Conference on Complex Systems, Paris, F 2005
Complex Time-Delay Systems (org. F.M. Atay), ECCS workshop, Paris, F 2005
6th ESMTB Conference 'Mathematical and Theoretical Biology', Dresden, D 2005- poster

2004 - 2002
5th ICSB International Conference on Systems Biology, Heidelberg, D2004- poster
2nd ECCB European Conference on Computational Biology, Paris, F 2003 (org. B.Prum,F.Kepes)
6th IBRO World Congress of Neuroscience, Praha, CZ 2003 (org. H.Illnerova,E.Sykova- *poster*
5th ESMTB Math Model&Comp in Biol&Medic, Milano, It 2002 (V.Capasso, A.Gaetano)- *poster*

5.2 (Bio)mathematics
(Dynamical Systems & Geometry, Mathematical Biology & Modeling)

Dynamic/complex systems, geometric/PDE methods, graph theory, MPI MiS Leipzig, D 2007-08
  (lectures by J. Jost, M. Schwarz, W. Koenig, N. Gantert, B. Sturmfels)
Systemes Dynamiques, seminars (org. by (J-C. Yoccoz, H. Eliasson), Uni Paris 6, F 2006
  (incl. lectures by M. Benedicks, B. Fayad)
Systemes Dynamiques (Ergodiques), course (R. Krikorian), ENS Paris, F 2006
Theorie d'Information, course (A. Chenciner), Uni Paris 6,7, F 2006
Geometrie, Probabilite et Applications, course (M. Gromov), Uni Paris 6, F 2006
Numerical Analysis, MBIO (org. A. Cohen, B. Perthame), half-semester Master2
Modelisation Mathematique, ENS/X/Uni Paris 6, F 2006
Imaging for Cellular and Molecular Dynamics: Fluorescence Microscopy,
  (org. M. Coppey), Inst. J. Monod, Uni Pari 7, F 2006
Math and Brain (org. D. Bennequin, B. Teissier), Mathematical Institute
  Jussieu, Univ. Paris 6, F 2005. Incl. courses of A. Chenciner,
  J. Petitot (geometry and dynamics), J-C. Yoccoz, B. Ermentrout, J-P. Francoise
  (dynamical systems), J-M. Morel, S. Mallat, Y. Fregnac (image analysis,
  wavelettes, PDE, variational forms), P. Bessiere, J. Droulez (bayesian analysis),
  D. Picard and S-I. Amari (statistics), A. Berthoz, S. Dehaene, M. Arbib (neurosci).
Trimester 'Time at Work' (org. V.Baladi, J.Bricmont, P.Collet, F.Ledrappier,
  C.Liverani), Institute Henri Poincare, Paris, F (April-July, 2005)
Dynamics and fluctuations in extended systems, Hamiltonian systems,
  Resonances and periodic orbits. Associated courses of A. Fathi,
  A. Avila, S. Aubry, D. Dolgopyat, F. Faure, J. Marklof.
Systemes Dynamiques Stochastiques, course (K. Pakdaman, P-Y. Boelle),
Geometrie et Dynamique, course (A. Chenciner),
Theorie des Jeux et Optimisation (S. Solomon),
  all Universite Paris 6, 7, F 2004
Systems Biology Dynamics: From Genes to Organisms (L. Glass, M. Mackey, M. Guevara,
  J. Milton, J. Belair, A. Vignet, P. Swain et al.), Center for Nonlinear Dynamics in
  Physiology and Medicine, McGill University, Montreal, CAN 2004
Modelisation et Simulation de Processus Biologiques dans le Contexte Genomique
  (organized by F. Kepes, V. Norris), Genopole/Universite d'Evry, F 2004
Imaging Techniques en Biologie, course (M. Coppey),
Calcul Differentiel, course (A. Chenciner),
Systemes Dynamiques, course (K. Pakdaman, M. Chaperon, A. Lesne, J-P. Aubin),
  all Universite Paris 6, 7, F 2004, 2003
Viability Theory, ComplexNet Meeting (org. J-P. Aubin),
  Institut Henri Poincare, CNRS/Universite Paris 6 et 7, F 2003
Modelisation en Genomique Fonctionelle, course (D. Mestivier, K. Pakdaman),
Modelisation des Systemes Biochimiques, course (R. Chambert, N. Kellershohn),
Modelisation par Agents, Calcul Intensif pour la Biologie, course (org. D. Mestivier, J-P. Treuil),
  all Universite Paris 6, 7, 9, et INSERM U444, F 2004, 2003
Autumn School on Theoretical Immunology (L.A.Segel, A.Perelson, R.deBoer),
  org. by ITB, Humboldt University Berlin, D 2002
Biomathematics Euro Summer School 'Dynamical Systems in Physiology and Medicine',
  delay systems (org. A. de Gaetano, E. Beretta, and O. Arino), Urbino, It 2002
Graph Theory (J. Niederle), CoputerSci, Masaryk Uni Brno, CZ 2002

5.3 (Bio)informatics

Informatique en Biologie (Biological software and databases group,
  K. Lethondal, K. Schuerer, Ph. Faure), Institute Pasteur, Paris, F
  (January-April, 2005). Object oriented programming (Python),
  algorithms in bioinformatics, databases (SQL, HTML, XML), C programming
  for sequence analysis, Unix. Mini-project: Conversion algorithms
  from noisy time-series data to symbolic dynamics sequences.
Bioinformatica
  (4 - Drug Design, G. Schaftenaar, J. de Vlies), (2 - Protein Structures, G. Vriend),
  (WHAT_IF Course, G. Vriend, E. Kruger), (Bioinformatics School, G.Vriend, C.vanHelder),
  all CMBI RadboudUni Nijmegen, NL 2003, 2002
Summer School Medicinal Chemistry (H. Kubinyi, G. Muller), Uni Regensburg, D 2002

5.4 (Bio)statistics

Lectures/practicals of DEA/Masters Biomathematique, Bioinformatique,
  on particular statistical methods/analyses (P-Y. Boelle, G. Thomas et al.),
  Universite Paris 6 et 7, F 2004, 2003
Planning, organization and evaluation of clinical studies (V. Stranadova, L. Dusek),
Analyses of clinical data (all L. Dusek), Basics in stochastic modeling,

Statistical evaluation of biodiversity, Multivariate statistical methods, Biostatistics,
  (all L. Dusek), all CBA, Sci/Med Masaryk Uni Brno, CZ 2002-2001
Statistical analysis (Z. Karpisek), Technical Uni Brno, CZ 2001

6. Teaching, Professional Experience
6.1 Projects / Teaching

curr-2010 *Imaging, (Tele)Communication & Elm Waves Propagation/Signaling in BiolTissues*
  (prepared with VUT Brno, ISI Brno, FI MU, PSI Drasov)
curr-2010 *Energy Management in Biol/Ecol and Engineer Syst* (with T.Vallaeys, ?EU EnergyNet)
curr-2009 *(Patho)Physiology of Artificial Light Sources* (with L.Nedbal &PhotonSystemsInstr)
2009Dec-Oct *planning&organization*: 1-week CZ-lab-tour for Raoul D'Huys / Viktor Jirsa
  (*Theor&Comput Neurosci* Lab, Uni Marseille) – pre-EU-project strategic meetings
curr-2006 *consultations* (dynamical systems, game/info theory, networks, (bio)informatics,
  statistics, numerics/simulations, modeling & phys-chem-bio-med aspects), research/EU
  projects, master+PhD students @IMJ/UPMC.fr, MPImis.de, IZBI.de, INRA.fr, IPB.cz
2008-07 *consultations for student groups* @ISCpif Complex Systems Summer Schools (Paris)
2006 *co-supervisor* of A. Mishra (with L.Nedbal, PhD thesis @Inst Physical Biology)
2006-05 *Physical Biology* @Inst Physical Biology, S. Bohemia University
  (*dynamical systems, modeling in biology&biophysics* – gradCourse, design+lect+pract,
  stochastic thermodynamics - practicals)
2003-01 *Pathophysiology* @Medical Faculty, Masaryk Uni Brno (*experim &
  statist.analyses* - seminars, practicals). *Bioinformatics* seminars

6.2 Professional Experience
6.2.0
Scientific Community Services:
referee for IOP Inst Of Physics, Elsevier, projects design/consultations
6.2.1
Mathematical analysis/simulations:
geometric propagation/trajectories evolution in dynamic heterogenous media, adaptive
molecular nanostructures, photo-acoustic media, (quantum) optics, elm/color theory;
dynamic regulatory systems in biology and (patho)physiology;
local/global mathematical analysis, ordinary, delay, partial, stochastic differential systems,
discrete-time, piece-wise constant models, numerical simulations/method,agent-based modeling;
(ergodic) dynamical systems, geometrical/topological methods, graph theory,
information&measure theory, symbolic dynamics, time-series analysis
6.2.2
Statistical methods in Bioinformatics:
multivariate statistics, clustering, Bayesian methods, graphs, optimization, Markov chains
6.2.3
Structural chemistry and Bioinformatics:
2D, 3D alignment techniques, molecular modeling; database retrieval, SQL databases, web-api.
6.2.4
Computer/language skills:
#Operating systems: Unix/Linux, MacOSX, OS2, Windows
#Computer programs: Gnuplot, LaTeX; Matlab-Scilab/Octave/Sage, Mathematica, Comsol,
  'DynSyst tools'; Statistica, WHAT_IF, SPDBViewer (molecular modeling packages), on-line
  tools of bioinformatic databases (SRS7-); OpenOffice/MS-Office packg, graphics (Gimp)
#Computer languages: C(++), Python, Shell, (Awk, R, SQL, (X)HTML)
#Other languages/writingSystems: Czech, English, French, German, Russian, (++)
6.2.5
Experimental/analytical work:
#immunology, molecular/cellular biology:
  RIA, ELISA, flow cytometry, fluorescence microscopy, PCR,
#(patho)physiology:
  standard physiological/biophysical measurements, experimental surgery
#(bio)chemistry, physical chemistry:
  [olympiads for secondary school students & voluntary activities]
  chemical synthesis, analysis -electrophoresis, spectral methods,
  phys-chem properties of soft matter (bio origin)

7. Grants, Fellowships, Memberships

7.1 Grants/Fellowships:
  combined visitor's programme (F-I-D 2009-2012)
  CNRS (short term visitor, F 2004+),
  MaxPlanck Ges. (postdoc, D 2007-2008)
7.2 Grants preparation:
  FP7 consultations (T. Vallaeys et al., 2007-08),
  CAS/NSF (L. Nedbal et al., 2007, circadian rhythms in cyanobacteria, green energy),
  ESF (L. Nedbal et al., 2006, automatic microscope: image analysis&navigation),
  FP6 (I. Nentwich et al. 2003, postnatal/pedi-immunology/allergology)
7.3 Memberships:
  ESMTB (European Society for Mathematical and Theoretical Biology)
  CSS (Complex Systems Society)

8. Planned & Past Visits/Collab/Corresp (non-CZ, without order)

ATI-USurrey/Imperial (metaMat O.Hess, L.Solymar), ICFO Barcelona (Photonic grp, NvHuist), CSIC
Madrid (RandPhot C.Lopez), Rowlands-Hvd/Freiburg (ChirLiq P.Fischer), Milano (UniMiBicocca Math
L.DeMichele/ N.Varopoulos, Phys G.Benedek),
Imperial/Ox/Exeter (BiPhot A.Parker,J.Vukusic,P.Ashwin,meteo), Bristol (Math, Cmplx), Bielefeld
(StochDS B.Gentz), Tel Aviv (physBi E.Ben-Jacob), ?Stowers/Strasbourg (embryo O.Pourqie), Paris
(UPMC/UP7/ENS Y.Couder, IMJ/IMJ, ISCpif cmplxEmbryo Doursat-Bourgine-Peyrieras, INRIA
microBiEnerg T.Vallaeys), Aberdeen/QueensLond (DynSystBiEnerg C. Grebogi, D.Arrowsmith), Wien
(DynSyst-Game, J.Hofbauer), Berlin (HU, FHI), Kiel (DynSyst, J-C.Claussen), MIT/Columb (magnetTunnel
J.Moodera, circDichr N.Berova), UArizona (metaAntenna++ R.Ziolkowski, F.Kueppers, G.Khitrova), other
discussions (Y.Akhtman-P.Lagoudakis, A.Pohlman, M.Debbah, C.Parnaud, Q.Ren, M.Hoffmann)

9. Contact & References

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Boční 1104/II, Praha 4, Czech Republic
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http://www.ufa.cas.cz/profile/koucka-knizova-petra

L. Nedbal / (new locations [Brno, Drasov])
Inst. of Systems Biology and Ecology, Czech Academy of Sciences
Zamek 136, CZ-37333 Nove Hrady, Czech Republic
Ph/Fax +420-386361231
http://www.greentech.cz (formerly), LN currently@
http://parc.wustl.edu/people/nedbal-ladislav
http://www.czechglobe.cz/structure/index.php?node=228
http://www.psi.cz, http://www.e-photosynthesis.org

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Inselstr. 22, D-04103 Leipzig, Germany
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http://www.mis.mpg.de
http://www.mis.mpg.de/jjost/neuro

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